

LISTING OF CLAIMS

1.(currently amended) A resin composition comprising:

a film-forming polyester; and

an effective amount of oxygen-scavenging particles comprising at least one oxygen-scavenging element capable of reacting with molecular oxygen; wherein the particles have a particle size distribution such that particles of greater than and less than about 25 microns in size are present, but those particles less than about 25 microns in size do not exceed a concentration defined by the formula

$$\text{ppm} = 512.3 \times d$$

wherein ppm is the approximate concentration of particles of less than about 25 microns in size in parts per million by weight, and d is the apparent density of the particles of less than about 25 microns in size in grams per cubic centimeter.

2.(original) The resin composition of claim 1, wherein said polyester comprises linear polyesters or branched polyesters.

3.(original) The resin composition of claim 1, wherein said polyester comprises polyethylene terephthalate, copolymers of polyethylene terephthalate, polyethylene naphthalate, copolymers of polyethylene naphthalate, polybutylene terephthalate, copolymers of polybutylene terephthalate, polytrimethylene terephthalate, or copolymers of polytrimethylene terephthalate.

4.(original) The resin composition of claim 1, wherein said oxygen-scavenging element comprises calcium, magnesium, scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, silver, zinc, tin, aluminum, antimony, germanium, silicon, lead, cadmium, rhodium, or combinations thereof.

5.(original) The resin composition of claim 1, wherein said oxygen-scavenging element comprises iron.

6.(original) The resin composition of claim 1, wherein said effective amount of oxygen-scavenging particles is from about 50 to about 2500 parts per million by weight of the resin.

7.(original) The resin composition of claim 1, wherein said oxygen-scavenging particles have a particle size range of about 20 to about 70 microns.

8.(original) The resin composition of claim 1, wherein said particles of less than about 25 microns in size have an apparent density of about 2.44 grams per cubic centimeter.

9.(original) The resin composition of claim 1, wherein particles of less than about 20 microns in size have an apparent density of about 2.44 grams per cubic centimeter, and do not exceed a concentration of about 800 parts per million by weight of the resin.

10.(original) The resin composition of claim 1, wherein said oxygen-scavenging particles are pre-treated with one or more reaction-enhancing agents.

11.(original) The resin composition of claim 1, wherein bottles produced from said resin have a Hunter haze value of about 10 % or less.

12.(currently amended) A resin composition comprising:

a film-forming polyester; and

an effective amount of oxygen-scavenging iron particles, wherein the iron particles have a particle size distribution such that particles of less than about 25 microns in size are present, but do not exceed about 1250 parts per million by weight of the resin.

13.(original) The resin composition of claim 12, wherein said polyester comprises linear polyesters or branched polyesters.

14.(original) The resin composition of claim 12, wherein said polyester comprises polyethylene terephthalate, copolymers of polyethylene terephthalate, polyethylene naphthalate, copolymers of polyethylene naphthalate, polybutylene terephthalate, copolymers of polybutylene terephthalate, polytrimethylene terephthalate, or copolymers of polytrimethylene terephthalate.

15.(original) The resin composition of claim 12, wherein said effective amount of iron particles is from about 50 to about 2500 parts per million by weight of the resin.

16.(original) The resin composition of claim 12, wherein said iron particles have a particle size range of about 20 to about 70 microns.

17.(original) The resin composition of claim 12, wherein particles of less than about 20 microns in size do not exceed about 800 parts per million by weight of the resin.

18.(original) The resin composition of claim 12, wherein said oxygen-scavenging particles are pre-treated with one or more reaction-enhancing agents.

19.(original) The resin composition of claim 12, wherein bottles produced from said resin have a Hunter haze value of about 10 % or less.

20.(previously amended) A resin composition comprising a film-forming polyester and from about 50 to about 2500 parts by weight of oxygen-scavenging iron particles per million parts by weight of the resin, wherein the concentration of iron particles of less than about 25 microns in size does not exceed about 1250 parts per million by weight of the resin.

21.(original) The resin composition of claim 20, wherein said polyester comprises linear polyesters or branched polyesters.

22.(original) The resin composition of claim 20, wherein said polyester comprises polyethylene terephthalate, copolymers of polyethylene terephthalate, polyethylene naphthalate, copolymers of polyethylene naphthalate, polybutylene terephthalate, copolymers of polybutylene terephthalate, polytrimethylene terephthalate, or copolymers of polytrimethylene terephthalate.

23.(original) The resin composition of claim 20, wherein said iron particles have a particle size range of from about 20 to about 70 microns.

24.(original) The resin composition of claim 20, wherein particles of less than about 20 microns in size do not exceed about 500 parts per million by weight of the resin.

25.(original) The resin composition of claim 20, wherein said oxygen-scavenging particles are pre-treated with one or more reaction-enhancing agents.

26.(original) The resin composition of claim 20, wherein bottles produced from said resin have a Hunter haze value of about 10 % or less.

27.(original) A polyester resin composition for use in forming transparent articles having low haze, the resin composition comprising from about 50 to about 2500 parts by weight of iron particles per million by weight of the resin, wherein said transparent articles have a Hunter haze value of about 10 % or less.

28.(original) The resin composition of claim 27, wherein said polyester comprises polyethylene terephthalate, copolymers of polyethylene terephthalate, polyethylene naphthalate, copolymers of polyethylene naphthalate, polybutylene terephthalate,

copolymers of polybutylene terephthalate, polytrimethylene terephthalate, or copolymers of polytrimethylene terephthalate.

29.(original) The resin composition of claim 27, wherein said iron particles have a particle size distribution such that particles of less than about 25 microns in size do not exceed a concentration defined by the formula

$$\text{ppm} = 512.3 \times d$$

wherein ppm is the approximate concentration of particles of less than about 25 microns in size in parts per million by weight, and d is the apparent density of the particles of less than about 25 microns in size in grams per cubic centimeter.

30.(original) An article formed from a resin composition comprising an effective amount of oxygen-scavenging particles, wherein the Hunter haze value of the article is about 10 % or less.

31.(original) The article of claim 30, wherein said article is a bottle.

32.(original) The article of claim 30, wherein said resin composition comprises polyethylene terephthalate, copolymers of polyethylene terephthalate, polyethylene naphthalate, copolymers of polyethylene naphthalate, polybutylene terephthalate, copolymers of polybutylene terephthalate, polytrimethylene terephthalate, or copolymers of polytrimethylene terephthalate.

33.(original) The article of claim 30, wherein said Hunter haze value of said article is about 8 % or less.

34.(currently amended) A method for incorporating high levels of oxygen-scavenging particles into a film-forming polyester resin composition with low haze comprising the steps of:

providing an effective amount of oxygen-scavenging particles comprising at least one oxygen-scavenging element capable of reacting with molecular oxygen,

wherein the particles have a particle size distribution such that particles of greater than and less than about 25 microns in size are present, but those particles less than about 25 microns in size do not exceed a concentration defined by the formula

$$\text{ppm} = 512.3 \times d$$

wherein ppm is the approximate concentration of particles of less than about 25 microns in size in parts per million by weight, and d is the apparent density of the particles of less than about 25 microns in size in grams per cubic centimeter;

adding said oxygen-scavenging particles to a polyester resin composition during one or more of the process steps of
melt phase polymerization of the polyester;
post polymerization and prior to pelletization;
solid state polymerization of the polyester; and
extrusion.

35.(original) The method of claim 34, wherein said step of adding oxygen-scavenging particles to a polyester resin composition produces a masterbatch of oxygen-scavenging resin; and wherein said method further comprises the step of adding said masterbatch to additional resin.

36.(original) The method of claim 34, wherein said polyester resin comprises polyethylene terephthalate, copolymers of polyethylene terephthalate, polyethylene naphthalate, copolymers of polyethylene naphthalate, polybutylene terephthalate, copolymers of polybutylene terephthalate, polytrimethylene terephthalate, or copolymers of polytrimethylene terephthalate.

37.(original) The method of claim 34, wherein said oxygen-scavenging particles comprise oxidizable forms of calcium, magnesium, scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, silver, zinc, tin, aluminum, antimony, germanium, silicon, lead, cadmium, rhodium, or combinations thereof.

38.(original) The method of claim 34, wherein said oxygen-scavenging element comprises iron.

39.(original) The method of claim 34, wherein said effective amount of oxygen-scavenging particles is from about 50 to about 2500 parts per million by weight of the resin.

40.(original) The method of claim 34, wherein said particles of less than about 25 microns in size have an apparent density of about 2.44 grams per cubic centimeter.

41.(original) The method of claim 34, wherein particles of less than about 20 microns in size have an apparent density of about 2.44 grams per cubic centimeter, and do not exceed a concentration of about 800 parts per million by weight of the resin.

42.(original) The method of claim 34, wherein said oxygen-scavenging particles are pre-treated with one or more reaction-enhancing agents.

43.(original) The method of claim 34, wherein bottles produced from said resin have a Hunter haze value of about 10 % or less.

44.(previously and currently amended) A resin composition comprising:
a film-forming polyester; and
particulates comprising oxygen-scavenging particles capable of reacting with molecular oxygen; wherein the particulates have a particle size distribution such that particles of greater than and less than about 25 microns in size are present, but those particles less than about 25 microns in size do not exceed a concentration defined by the formula

$$\text{ppm} = 512.3 \times d$$

wherein ppm is the approximate concentration of particles of less than about 25 microns in size in parts per million by weight, and d is the apparent density of the particles of less than about 25 microns in size in grams per cubic centimeter.

45.(New) A resin composition comprising:

a film-forming polyester; and

an effective amount of oxygen-scavenging particles comprising at least one oxygen-scavenging element capable of reacting with molecular oxygen; wherein the particles have a particle size distribution such that particles within the size range of from about 25 to about 38 microns are present, and particles within the size range of from about 38 to about 45 microns are present, and wherein particles of less than about 25 microns in size do not exceed a concentration defined by the formula

$$\text{ppm} = 512.3 \times d$$

wherein ppm is the approximate concentration of particles of less than about 25 microns in size in parts per million by weight, and d is the apparent density of the particles of less than about 25 microns in size in grams per cubic centimeter.

46. (New) A resin composition comprising:

a film-forming polyester; and

an effective amount of oxygen-scavenging particles comprising at least one oxygen-scavenging element capable of reacting with molecular oxygen; wherein the particles have a particle size distribution such that particles within the size range of from about 38 to about 45 microns are present, and particles within the size range of from about 45 to about 75 microns are present, and wherein particles of less than about 25 microns in size do not exceed a concentration defined by the formula

$$\text{ppm} = 512.3 \times d$$

wherein ppm is the approximate concentration of particles of less than about 25 microns in size in parts per million by weight, and d is the apparent density of the particles of less than about 25 microns in size in grams per cubic centimeter.

47.(New). A resin composition comprising:

a film-forming polyester; and

an effective amount of oxygen-scavenging particles comprising at least one oxygen-scavenging element capable of reacting with molecular oxygen; wherein the particles have a particle size distribution such that particles within the size range of from about 25 to about 38 microns are present, and particles within the size range of from about 38 to about 75 microns are present, and wherein particles of less than about 25 microns in size do not exceed a concentration defined by the formula

$$\text{ppm} = 512.3 \times d$$

wherein ppm is the approximate concentration of particles of less than about 25 microns in size in parts per million by weight, and d is the apparent density of the particles of less than about 25 microns in size in grams per cubic centimeter.

48.(New) A resin composition comprising:

a film-forming polyester; and

an effective amount of oxygen-scavenging particles comprising at least one oxygen-scavenging element capable of reacting with molecular oxygen; wherein the particles have a particle size distribution such that particles within the size range of from about 25 to about 45 microns are present, and particles within the size range of from about 45 to about 75 microns are present, and wherein particles of less than about 25 microns in size do not exceed a concentration defined by the formula

$$\text{ppm} = 512.3 \times d$$

wherein ppm is the approximate concentration of particles of less than about 25 microns in size in parts per million by weight, and d is the apparent density of the particles of less than about 25 microns in size in grams per cubic centimeter.